

## PART 1 - GENERAL

### 1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

#### AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS (AATCC)

AATCC 16	(1993) Colorfastness to Light
AATCC 107	(1997) Colorfastness to Water
AATCC 129	(1996) Colorfastness to Ozone in the Atmosphere under High Humidities
AATCC 134	(1996; R 1996) Electrostatic Propensity of Carpets
AATCC 165	(1993) Colorfastness to Crocking: Carpets - AATCC Crockmeter Method

#### AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 418	(1993) Testing Pile Yarn Floor Covering Construction
ASTM D 1335	(1998) Tuft Bind o f Pile Yarn Floor Coverings
ASTM D 1423	(1998) Twist in Yarns by Direct-Counting
ASTM D 2257	(1996) Extractable Matter in Textiles
ASTM D 3936	(1997) Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering
ASTM E 648	(1997) Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source

#### CODE OF FEDERAL REGULATIONS (CFR)

16 CFR 1630	Surface Flammability of Carpet and Rugs
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#### CARPET AND RUG INSTITUTE (CRI)

CRI 104	(1994) Installation of Commercial Texture Floorcovering Materials
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#### FEDERAL STANDARDS (FED-STD)

FED-STD-501	(Rev. A) Floor Coverings, Resilient, Nontextile: Sampling and Testing
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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION (ISO)

ISO 2551 (1981) Man-made Textile Floor Coverings  
Determination of Dimensional Changes Due to the  
Effect of Varied Water and Heat Conditions (AACHEN  
Test)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 99 (1996) Health Care Facilities

NFPA 101 (1997) Life Safety Code

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

1.2.1 SD-04, Samples

- a. Carpet tile
- b. Molding

1.2.2 SD-06, Test Reports

- a. Flammability
- b. Static control
- c. CRI Green Label Requirements for Indoor Air Quality Test Criteria
- d. ADA requirements

The reports shall be dated within two years of submittal for approval.

1.2.3 SD-08, Manufacturer's Instructions

- a. Carpet tile installation

Submit the carpet manufacturer's printed installation instructions. Include procedures for installation covering preparation of the substrate, seaming techniques, and recommended adhesives and tapes where applicable.

1.2.4 SD-10, Operation and Maintenance Data

- a. Carpet tile, Data Package 1

Submit data package in accordance with Section 01781, "Operation and Maintenance Data." Submit copies of the manufacturer's maintenance manual.

### 1.3 INSTALLATION REQUIREMENTS

#### 1.3.1 Experience

All work shall be done by installation firms specializing in commercial carpet installation. The firm shall be a member of the Floor Covering Installation Contractor's Association (FCICA) or certified by the Floor Covering Installation Board (FCIB).

#### 1.3.2 Certificate

Submit certificate from the Contractor attesting that the installation supervisor has had a minimum of 5 years experience in this type of work and will provide qualified, experienced installers to perform work. Include a list of previous jobs giving name, location, dollar value, and date, setting forth supervisor's installation experience.

### 1.4 DELIVERY AND STORAGE

Deliver carpet tile to the site in manufacturer's original wrappings and packages clearly labeled with the manufacturer's name, brand name, size, and related information. Attach register number or stencil on carton. Store in a safe, dry, clean, and well ventilated area. Do not open containers until needed for installation unless verifying inspection is required. Do not stock more than eight cartons high.

### 1.5 SAFETY

Carpet adhesives may contain toxic volatile components. Follow ventilation, personal protection, and other safety precautions as recommended by the manufacturer of the adhesive.

### 1.6 REGULATORY REQUIREMENTS

#### 1.6.1 Indoor Air Quality

Carpet shall bear the Carpet and Rug Institute (CRI) Indoor Air Quality (IAQ) label. Carpet type bearing the label will indicate that the carpet has been tested and meets the criteria of the CRI Green Label Requirements for Indoor Air Quality Test Criteria.

#### 1.6.2 ADA Requirements

Carpet shall meet the ADA requirements as follows:

If carpet tiles are used on a ground or floor surface, then it shall be securely attached; have a firm cushion, pad, or backing, or no cushion or pad; and have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. The maximum thickness shall be 1/2 inches. Exposed edges of carpet shall be fastened to floor surfaces and have trim along the entire length of the exposed edge.

## PART 2 - PRODUCTS

### 2.1 PHYSICAL REQUIREMENTS

Provide carpet tile from manufacturer's standard stock. Carpet shall be first quality; and free of visual blemishes, streaks, poorly dyed areas, and other physical and manufacturing defects. Use nontoxic carpet materials and treatments, reasonably nonallergenic, and free of other recognized health hazards. Provide carpet tile of tufted, woven, or fusion bonded construction with a secondary backing of vinyl or prereacted polyurethane hardback, or a woven polypropylene fabric with a thermoplastic mixture of ethylene/vinyl acetate polymer and a hydrocarbon resin (hot melt). Carpet tile shall be of the modular type, identical in size, precision die cut for complete interchangeability. Sides shall be straight and the corners square. Tufts shall be firmly secured at the edges as in the other areas of the carpet tile. Carpet tile must lay flat on a flat surface without curling, warping, buckling, cupping, or doming and without any lumpiness, unevenness, or differences in thickness in individual tiles or from tile-to-tile. Provide carpet tile that does not stretch or shift position in use when installed according to the carpet tile manufacturer's instructions. Use nontoxic carpet tile materials and treatment, free from other recognized health hazards, and conforming to the following:

- a. Surface Texture: Tufted
- b. Pile Yarn Type: Pattern loop.
- c. Pile Fiber: Commercial Nylon.
- d. Finished Pile Yarn Weight: Minimum 28 oz/sqyd. minimum. This does not include weight of backings. Weight shall be determined in accordance with ASTM D 418.
- e. Pile Density: Minimum 6720 oz/cuyd. minimum.
- f. Width: 18 inch by 18 inch plus or minus 1/16 inch
- g. Gage: 1/10 per one inch minimum in accordance with ASTM D 418.
- h. Dye method: Solution dyed
- i. Pattern and Color: To be selected from manufacturer's full range of color selections.

#### 2.1.1 Surface Texture

##### 2.1.1.1 Loop Pile

Provide either single-level uncut pile or textured uncut pile creating an overall nondirectional surface. Maximum differential finished pile heights (high and low pile loops) of textured pile is 0.125 inch.

#### 2.1.2 Pile Yarn

Do not use reclaimed yarn fibers from any woven, tufted, knitted, or felted products. Do not use undrawn fiber in spun yarn. Provide spun yarn of at least two ply for loop pile carpet tile. Use yarn setting method sufficient to assure permanent texture retention under normal use conditions, cleaning, and shampooing. Use autoclave or continuous heat process to set yarn in cut pile construction; yarns for fusion bonded plush cut pile may be crimp-set. Fiber denier and staple lengths may be subject to normal manufacturing tolerances with the following limitations:

- a. Acceptable variance in staple length, plus or minus 10 percent.
- b. Acceptable denier variance, plus or minus 10 percent, in individual filament denier and plus or minus 3 percent in average denier.

#### 2.1.2.1 Twist and Twist Multiplier

For loop pile carpet tile, ASTM D 1423. The minimum twist multiplier for singles is 2.75; minimum for a 2-ply yarn is 80 percent of the twist in the singles yarns; for a 3-ply yarn, 70 percent; and for a 4-ply yarn, 60 percent.

#### 2.1.2.2 Staple Nylon

Carpet fiber with average fiber size of 15 denier or coarser and minimum staple length of 6 inches.

#### 2.1.2.3 Continuous Hollow Filament Nylon

Branded, continuous high bulk or textured carpet fiber with average filament size of 15 denier or coarser modified to provide increased translucence or opacity for soil hiding.

#### 2.1.2.4 Extractable Matter in Finished Yarn

Not more than two percent when tested in accordance with ASTM D 2257.

#### 2.1.3 Primary Carpet Backing

Those customarily used and accepted by the trade for each type of carpet tile. Use a back coating compound of synthetic resin or natural or synthetic latex compound. Use back coating quantity normally used in the supplier's product.

#### 2.1.4 Secondary Backing

Shall be fiberglass reinforced vinyl hardback for fusion bonded carpet tile. Should be prereacted polyurethane hardback, fiberglass reinforced vinyl hardback, or woven polypropylene fabric adhered with ethylene/vinyl acetate polymer and hydrocarbon resin (hot melt) for woven or tufted carpet tile.

##### 2.1.4.1 Vinyl Hardback

A suitably compounded virgin polymer or copolymer of vinyl chloride resin, plasticized with compatible, primary plasticizers only. Virgin polymer is defined as a polymer or copolymer that has not been processed into a finished product prior to use in the hardback. Primary plasticizers are as plasticizers which are individually and totally compatible with the polymers or copolymers of vinyl chloride resin. Use compound that is uniform and free from objectionable odor, and conforming to the following:

- a. Hardback: Average not less than 0.115 inch in total backing thickness.
- b. Weight: Average not less than 125 oz/sq. yd.
- c. Compression resistance: Not less than 100 pounds per square inch.
- d. Adherence: No separation of the carpet tile and hardback.

e. Accelerated weathering: No cracking, stiffness, brittleness, soft or tacky and appreciable change in color, when compared to the unexposed sample, after 100 hours in the weatherometer.

f. Flexibility at 70 degrees F and at 30 degrees F: No cracking, flaking, crazing, or show any other indication of failure.

g. Moisture absorbency: Maximum one percent moisture absorbency, after 4 hours submersion in water at 72 degrees F.

h. Volatile matter: No more than one percent.

## 2.2 PERFORMANCE REQUIREMENTS

### 2.2.1 Dimensional Stability

Dimensional stability shall be maintained at +/-, 0.2 percent maximum in according with ISO 2551 (AACHEN Test).

### 2.2.2 Delamination Strength

Delamination strength for turfed carpet with secondary back shall be a minimum of 25 lb/inch in accordance with ASTM D 3936.

### 2.2.3 Flexibility

Secondary backing must not crack, flake, craze, or show any other indications of failure when tested as specified below.

#### 2.2.3.1 At 70 Degrees F

Use a 4 by 4 inch specimen. Double the specimen and press flat on itself in any direction. Hold doubled for 5 minutes. Examine for indications of failure while doubled and after pressed flat. Make the examination visually at a distance of one foot.

#### 2.2.3.2 At 30 Degrees F

FED-STD-501, Method 6511, using one-inch mandrel plus or minus 1/8 inch.

### 2.2.4 Colorfastness to Light

AATCC 16. Use the Xenon arc as the light source. Consider colors that are deeper or equivalent in hue to Row 2 of the AATCC Color Transference Chart as dark colors; consider those lighter as light colors. Colors for synthetic yarns shall show a gray scale rating of at least 4 for light shades after the equivalent of two L-4 breaks and at least 4 for dark shades after the equivalent of at least three L-4 breaks. Woolen yarns show a gray scale rating of at least 4 for light shades after the equivalent of one L-4 break and at least 4 for dark shades after the equivalent of two L-4 breaks. Base classification on the AATCC Blue Wool Lightfastness Standards L-2 to L-9. Test all colors specified. If the Xenon Arc Fadeometer has a built-in continuous monitor and control device made by the manufacturer, the blue wool standards referenced in AATCC 16 need not be used to judge the L-4 breaks, providing the manufacturer's instructions are followed.

### 2.2.5 Dry and Wet Crocking, Color Fastness to Water and to Ozone

AATCC 165 AATCC 107 AATCC 129. All colors specified shall show a minimum rating of step 4 on the AATCC Color Transference Chart.

### 2.2.6 Pile Coverage

Sufficient to conceal backing.

### 2.2.7 Tuft Bind

ASTM D 1335. The minimum tuft bind for loop pile is 10 pounds and for cut pile 5 pounds.

### 2.2.8 Flammability

In addition to meeting the requirements of CPSC 16 CFR 1630, all carpet tile shall meet the minimum radiant flux requirements of NFPA 101 when tested in accordance with ASTM E 648. Test carpet tile and hardback together, as they will be installed.

### 2.2.9 Static Control

AATCC 134. Incorporate a permanent static control system to control static build-up to less than 2 .0 kV. Test at 20 percent relative humidity at 70 degrees F.

### 2.2.10 Electrical Resistance

NFPA 99, Chapter 3. Maximum electrical resistance for carpet tile shall be 20,000 megohms measured between the floor surface and building or applicable ground material, and shall provide a resistance of not less than 150 kilohms when measured from any point on the floor.

## 2.3 MOLDING

A hammered surface aluminum, pinless clamp-down type designed for the type of carpet tile being installed. Finish: color anodized aluminum vinyl. Provide floor flange at least 2 inches wide, face shall be a minimum 5/8 inch wide.

## 2.4 ADHESIVES

Waterproof, nonflammable, shall be a pressure sensitive releasable adhesive carpet as furnished or recommended by the carpet manufacturer. Use waterproof, nonflammable, and nonstaining seal adhesive as furnished or recommended by the carpet manufacturer. Low emitting volatile organic compound (VOC) adhesive should be used to improve indoor air quality.

## PART 3 - EXECUTION

### 3.1 CARPET TILE INSTALLATION

Install carpet tile in accordance with CRI 104 and manufacturer's printed instructions after the work of other trades, including painting, is done. Installed carpet tile must be smooth, uniform, and secure. Install tile with carpet pile lay in same direction. Fit cutouts, such as door jambs, columns, and ducts, neatly and securely.

### 3.1.1 Carpet Tile Location

Install carpet tile wall-to-wall in rooms and areas indicated on finish schedule in the drawings. Include all material indicated, specified, or necessary for a completely finished installation. Contractors responsible for providing carpet of the same dye lot for each type indicated, for the required quantities of carpet and must verify all dimensions in the field as well as other conditions affecting the work.

### 3.1.2 Extra Carpet Tile

Furnish 2% of each pattern and color in addition to the quantity required for installation. Furnish extra carpet tile, for replacement use, of same manufacturer, type, and quality as the installed carpet tile; provided in original cartons; and properly marked.

### 3.1.3 Substrate Preparation

Inspect rooms and areas to be carpeted. Before installation, verify that concrete floors comply with requirements on moisture content recommended by adhesive or carpet manufacturer's instructions. Repair holes, cracks, depressions, or rough areas using material recommended by the carpet tile manufacturer. Grind raised areas or ridges smooth and level with surrounding surface. Provide floor free of any foreign materials and swept broom clean. Comply with requirements for conditioning adhesives and minimum floor temperature before, during, and after installation as recommended by the carpet tile and adhesive manufacturer's instructions. However, in no case may floor temperature be less than 60 degrees F for 24 hours prior to, during, and after installation. Do not permit traffic or movement of furniture or equipment in carpeted areas for at least 24 hours after installation. Carpet tile installation constitutes validation by the Contractor that the substrate and conditions in the area meet all requirements for satisfactory installation.

### 3.1.4 Accessibility

Installed carpet tiles shall be removable. Ensure that the exposed area is capable of being restored to its original condition by replacing the removed tiles or installing new tiles of the same manufacturer, type, and quality.

### 3.1.5 Molding

Finish carpet tile edges meeting hard surface flooring with moldings. Install in accordance with manufacturer's instructions.

## 3.2 CLEANING AND PROTECTION

### 3.2.1 Cleaning

After installation, remove all debris, moldings, scraps, and other foreign matter. Remove any soiled spots or adhesive from the face of the carpet tile with the appropriate spot remover. Clip any protruding face yarn with sharp scissors. Vacuum the carpet tile until clean.



### 3.2.2 Protection

Carefully protect installed carpet tile with heavy, reinforced, nonstaining kraft building paper or polyethylene film of an approved quality and thickness. Lap and secure edges of covering widths. Keep covering in repair and replace damaged portions. Remove protective covering when directed by the Contracting Officer.

END OF SECTION